UNITED STATES DEPARTMENT OF AGRICULTURE
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M O N T H L Y N E W S L E T T E R

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Mr. McCrory left Washington on August 13 for an extended trip through the middle West, the Pacific Coast and the South, during which he will visit a number of the field stations and soil erosion experiment farms. He will return to Washington early in September.

During the period July 18 to 21, engineers of the Guthrie Soil Erosion Station cooperated with the Logan County agent in the construction of demonstration terraces on thirty acres of land owned by a local farmer. A Caterpillar tractor and terracer unit and a Wheatland 26-inch one way disc plow were furnished by the Bureau for this work. Operating expenses were paid by the farmer and engineering supervision was supplied by the erosion station. Slightly over one mile of terrace was built at an average cost of $13.68 per mile or 46 cents per acre for the total area protected. Terraces averaged 30 feet wide from cut to cut and were 18 inches high.

At the Fort Hays Experiment Station, R. R. Drake is designing and testing a new type terracing machine which, it is hoped, will combine the advantageous features of the most efficient machines now in use.

The construction of terraces and the installation of measuring units on the La Crosse, Wis., station have been completed. G. E. Ryerson is now compiling itemized cost records of this work.

Field work of a survey of the Zanesville (Ohio) soil erosion experiment farm has been completed by Paul L. Hopkins.

At the request of Senator George of Georgia, F. E. Staebner made an examination of the Magid orchard at Tallulah Grove, Ga. and has prepared a report thereon. It was found that irrigation is needed in this region since a study of rainfall records over a period of 5 years showed that from 4 to 10 irrigations annually could be applied profitably. A water supply was available for only about half of the orchard.

The testing of specimens of concrete exposed to acid soils and peat soils has been begun by D. G. Miller. In this connection F. O. Bartel is removing cylinders buried for several years in peat soil near Wilson, N.C. and shipping them to Mr. Miller. Additional specimens submerged in Medicine Lake, S. Dak. are also being tested.

In the experiments in ditch cleaning with a tractor and scoops, W. D. Ellison reports cost of excavation in one section of ditch was 23 cents per cubic yard and the highest 27 cents. He attributes the low cost to the use of two large

scoops instead of one large and one small scoop. Mr. Ellison has also made some tests recently with an explosive called Cordeau. Two rows of Cordeau were laid about a foot apart in a channel containing 4 inches of water where a dense growth of vegetation had completely blocked the flow. The explosive created an opening about 2½ feet wide and removed about 3 inches of mud, which was satisfactory for the situation.

An evaporation pan now in use at the Medford, Oregon, experiment station was designed by M. R. Lewis. The pan is 3 x 4 x 1.2 ft. and is sunk 10 ins. into the ground. Two adjustable partitions running longitudinally divide the pan into a water compartment on each side and a soil compartment in the center. A conduit passing from one water compartment to the other allows the water level in both compartments to remain the same. Many small holes in the partitions permit water to pass into the soil mass, so that the soil is kept saturated and a condition similar to that in the orchard during irrigation periods is achieved. Water loss is measured twice daily by means of a hook gage.

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Carl Rohwer spent some time in Nebraska cooperating with the Agricultural Engineering Department of the University of Nebraska on the pump efficiency and ground water studies being conducted in Hall County, near Grand Island. A 50 h.p. cradle-mounted gasoline engine used for the tests is mounted on a large truck which makes it possible to reach the pumping plants with little or no difficulty, and the whole unit is sufficiently flexible to test all the sizes of plants found in that section. A complete test of a plant covering five or six different discharges can be made in a single day.

Soil sampling in connection with alkali reclamation experiments in Idaho under the direction of J. C. Marr is practically completed. Indications are that copious irrigation has done more to restore desirable soil characteristics than any other treatment. Where water has been applied in large amounts and at frequent intervals, the soil has become less impervious and tough, and grass of some description has started. This change in soil texture extends several feet in depth. Where water has been withheld for fear a high water table might result and aggravate the alkali trouble, less improvement in the soil is noted. There is a pronounced improvement in the soil where chemicals were used, but it is still apparent that the expense of this treatment is greater than is justified by results.

Further studies have been made by L. M. Winsor relative to the sufficiency of earthen embankments to permanently withstand wave and ice action. Experimental sections at the mouth of Jordan River, built in 1927, were examined and re-cross-sectioned. Results corroborate former tentative conclusions, that earthen embankments with flat slopes between 10 and 20 feet horizontal to 1 foot vertical tend toward permanence and that after the first or second season of operation under heavy wave action there is very little change in slope below high water line.

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Tests made by J. H. McCormick at Bard, Calif. showed that the roots of young alfalfa did not extend deeper than 28 inches and the majority of them were not deeper than 24 inches. Of some 20 plants of old alfalfa examined, only one was rooting as deep as 33 inches, with the bulk of them at 26 to 28 inches. Cotton roots proved to be mostly above 18 inches from the surface, with the height of the plants above ground 30 to 36 inches.

Two sled types of cornstalk harvesters have been constructed at the Toledo shop under the supervision of R. M. Merrill, and will be given field trials during the corn cutting season. A mechanical corn picker with a cutter head attachment for cutting up cornstalks at the time the corn is picked is also being constructed and will be ready for the fall picking season.

Fertilizer placement experiments are in progress in 12 States. The crops under study are cotton, potatoes, and sugar beets. The Division of Mechanical Equipment is cooperating in a total of 29 such experiments, the work being under the direct charge of G. A. Cumings. The experiments with potatoes in Ohio and Michigan indicate that fertilizers placed directly below the seed or in close proximity have a deterrent effect, but when placed in bands more than 1 inch to each side of the seed no delay or injury results. In general the same is true of cotton. Under conditions of excessive moisture immediately after planting, deterrent effects are greatly reduced. For sugar beets small amounts of superphosphate are usually applied, and since this material is not highly soluble there appears to be an advantage under normal conditions in placing it near the seed.

Preliminary trials with the sugar beet harvester made at Davis, Calif. by E. M. Mervine, would indicate that it may be possible to harvest on a commercial basis. With that in mind, 100 acres have been contracted for and studies are being made on the quality of work capacity, labor and power requirements, and other operating factors of this harvester.

A field day attended by 200 farmers was held at the West Point, Miss. experiment field, a branch of the Mississippi Agricultural Experiment Station, which is cooperating with our Bureau in cotton production machinery studies. On the program was a demonstration by John W. Randolph of his variable depth planter, middle buster with dynamometer, cultivator with another type dynamometer developed by himself and a specially constructed 2-row tractor cultivator. He reports the farmers showed much interest in the progress being made in machinery development. Of the engineering plots inspected, perhaps the greatest interest was shown in the cross-row cultivation plots wherein the control of weeds seemed to have been considerably advanced.

C. K. Shedd reports the completion at Ames, Iowa, of a power take-off dynamometer attachment for a Bureau-owned tractor. This will permit the study of power requirements of machinery driven by the power take-off.

A soy bean harvester has been built at Alexandria, Va. which will be used this fall in connection with a study of soy bean harvesting machinery in the Mississippi Delta. An inspection was made of this machine recently by R. B. Gray, and W. M. Hurst of the Bureau and Prof. C. E. Seitz of the Virginia Polytechnic Institute.

In response to a request made by the Bureau of Plant Industry, the Division of Mechanical Equipment has begun work on the development of a seed scarifier suitable for use on experiment stations and small farms. This work has been assigned to W. M. Hurst.

During July E. M. Dieffenbach, whose headquarters are at Albany, Ga. went to Gainesville, Fla. in response to a request by the Bureau of Plant Industry for assistance with their hay drier. He reports choking at the outlet of the drier as the main difficulty, which was eliminated by changing the thermostat bulb from a position perpendicular to the path of the hay to a position inclined 45° from this path.

In the forage drying studies at Jeanerette, La. E. D. Gordon reports the running of a test wherein the apron drier was used in conjunction with the recently installed drum drier. The ingoing drum temperatures were 1,000° F. to 1,200° F. The temperatures of the air in the conveyor drier were 225° to 300° F. In one run the moisture content of the hay was reduced from 63 per cent to 23 per cent in

passing through the drum drier and was further reduced to 8 per cent in passing through the apron drier.

A. D. Edgar has submitted a report on the past year's work at Presque Isle, Maine, to determine the relationship of storage house construction to storage losses of white potatoes.

A survey of farm dairy cooling plants in Maryland and northern Virginia is being made by John T. Bowen and J. R. McCalmont in cooperation with the Bureau of Dairy Industry. Information will be obtained regarding the costs of installation and operation, the quantities of milk cooled, the temperatures maintained, the variation of voltage on the electric power lines, and other pertinent data.

A report on the construction of the rammed earth building recently erected at the Arlington Farm has been prepared by W. V. Hukill. The building will be used for the fertilizer distributor experiments of the Bureau.

A public patent has been granted to Chas. A. Bennett for a vertical seed-cotton drier for use in improving the quality of ginned cotton.

Our Bureau librarian is trying to locate the following books:

Fortier, S. Use of water in irrigation, 3d ed., 1926.
Meyer, A. F. Elements of hydrology, 2d ed., 1928.

A new book entitled "Profitable Practice in Industrial Research", while intended primarily for industrial research workers, contains much of value to scientific workers. It may be borrowed from the Department library.